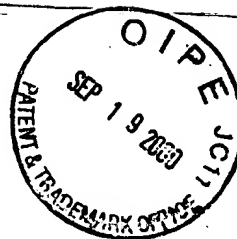


# SEQUENCE LISTING

<110> Burks Jr., A. Wesley  
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Huang, Shau-Ku  
Maleki, Soheila J.  
Kopper, Randall A.



RECEIVED

SEP 25 2000

TECH CENTER 1600/2900

<120> Tertiary Structure of Peanut Allergen ARA H 1

<130> HS 110

<140> 09/267,719

<141> 1999-03-11

<150> 60/077,763

<151> 1998-03-13

<160> 13

<170> PatentIn Ver. 2.1

<210> 1

<211> 626

<212> PRT

<213> Arachis hypogaea

<400> 1

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Leu Ala Ser Val Ser Ala Thr His Ala Lys Ser Ser Pro Tyr Gln Lys  
20 25 30

Lys Thr Glu Asn Pro Cys Ala Gln Arg Cys Leu Gln Ser Cys Gln Gln  
35 40 45

Glu Pro Asp Asp Leu Lys Gln Lys Ala Cys Glu Ser Arg Cys Thr Lys  
50 55 60

Leu Glu Tyr Asp Pro Arg Leu Val Tyr Asp Pro Arg Gly His Thr Gly  
65 70 75 80

Thr Thr Asn Gln Arg Ser Pro Pro Gly Glu Arg Thr Arg Gly Arg Gln  
 85 90 95  
 Pro Gly Asp Tyr Asp Asp Asp Arg Arg Gln Pro Arg Arg Glu Glu Gly  
 100 105 110  
 Gly Arg Trp Gly Pro Ala Gly Pro Arg Glu Arg Glu Arg Glu Glu Asp  
 115 120 125  
 Trp Arg Gln Pro Arg Glu Asp Trp Arg Arg Pro Ser His Gln Gln Pro  
 130 135 140  
 Arg Lys Ile Arg Pro Glu Gly Arg Glu Gly Glu Gln Glu Trp Gly Thr  
 145 150 155 160  
 Pro Gly Ser His Val Arg Glu Glu Thr Ser Arg Asn Asn Pro Phe Tyr  
 165 170 175  
 Phe Pro Ser Arg Arg Phe Ser Thr Arg Tyr Gly Asn Gln Asn Gly Arg  
 180 185 190  
 Ile Arg Val Leu Gln Arg Phe Asp Gln Arg Ser Arg Gln Phe Gln Asn  
 195 200 205  
 Leu Gln Asn His Arg Ile Val Gln Ile Glu Ala Lys Pro Asn Thr Leu  
 210 215 220  
 Val Leu Pro Lys His Ala Asp Ala Asp Asn Ile Leu Val Ile Gln Gln  
 225 230 235 240  
 Gly Gln Ala Thr Val Thr Val Ala Asn Gly Asn Asn Arg Lys Ser Phe  
 245 250 255  
 Asn Leu Asp Glu Gly His Ala Leu Arg Ile Pro Ser Gly Phe Ile Ser  
 260 265 270  
 Tyr Ile Leu Asn Arg His Asp Asn Gln Asn Leu Arg Val Ala Lys Ile  
 275 280 285  
 Ser Met Pro Val Asn Thr Pro Gly Gln Phe Glu Asp Phe Phe Pro Ala  
 290 295 300  
 Ser Ser Arg Asp Gln Ser Ser Tyr Leu Gln Gly Phe Ser Arg Asn Thr  
 305 310 315 320  
 Leu Glu Ala Ala Phe Asn Ala Glu Phe Asn Glu Ile Arg Arg Val Leu  
 325 330 335

Leu Glu Glu Asn Ala Gly Gly Glu Gln Glu Glu Arg Gly Gln Arg Arg  
340 345 350

Trp Ser Thr Arg Ser Ser Glu Asn Asn Glu Gly Val Ile Val Lys Val  
355 360 365

Ser Lys Glu His Val Glu Glu Leu Thr Lys His Ala Lys Ser Val Ser  
370 375 380

Lys Lys Gly Ser Glu Glu Glu Gly Asp Ile Thr Asn Pro Ile Asn Leu  
385 390 395 400

Arg Glu Gly Glu Pro Asp Leu Ser Asn Asn Phe Gly Lys Leu Phe Glu  
405 410 415

Val Lys Pro Asp Lys Lys Asn Pro Gln Leu Gln Asp Leu Asp Met Met  
420 425 430

Leu Thr Cys Val Glu Ile Lys Glu Gly Ala Leu Met Leu Pro His Phe  
435 440 445

Asn Ser Lys Ala Met Val Ile Val Val Val Asn Lys Gly Thr Gly Asn  
450 455 460

Leu Glu Leu Val Ala Val Arg Lys Glu Gln Gln Gln Arg Gly Arg Arg  
465 470 475 480

Glu Glu Glu Glu Asp Glu Asp Glu Glu Glu Glu Gly Ser Asn Arg Glu  
485 490 495

Val Arg Arg Tyr Thr Ala Arg Leu Lys Glu Gly Asp Val Phe Ile Met  
500 505 510

Pro Ala Ala His Pro Val Ala Ile Asn Ala Ser Ser Glu Leu His Leu  
515 520 525

Leu Gly Phe Gly Ile Asn Ala Glu Asn Asn His Arg Ile Phe Leu Ala  
530 535 540

Gly Asp Lys Asp Asn Val Ile Asp Gln Ile Glu Lys Gln Ala Lys Asp  
545 550 555 560

Leu Ala Phe Pro Gly Ser Gly Glu Gln Val Glu Lys Leu Ile Lys Asn  
565 570 575

Gln Lys Glu Ser His Phe Val Ser Ala Arg Pro Gln Ser Gln Ser Gln  
580 585 590

Ser Pro Ser Ser Pro Glu Lys Glu Ser Pro Glu Lys Glu Asp Gln Glu  
595 600 605

Glu Glu Asn Gln Gly Gly Lys Gly Pro Leu Leu Ser Ile Leu Lys Ala  
610 615 620

Phe Asn  
625

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<211> 371  
<212> PRT  
<213> Phaseolus vulgaris

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Lys Asn Gln Tyr Gly His Ile Arg Val Leu Gln Arg Phe Asp Gln Gln  
20 25 30

Ser Lys Arg Leu Gln Asn Leu Glu Asp Tyr Arg Leu Val Glu Phe Arg  
35 40 45

Ser Lys Pro Glu Thr Leu Leu Leu Pro Gln Gln Ala Asp Ala Glu Leu  
50 55 60

Leu Leu Val Val Arg Ser Gly Ser Ala Ile Leu Val Leu Val Lys Pro  
65 70 75 80

Asp Asp Arg Arg Glu Tyr Phe Phe Leu Thr Ser Asp Asn Pro Ile Phe  
85 90 95

Ser Asp His Gln Lys Ile Pro Ala Gly Thr Ile Phe Tyr Leu Val Asn  
100 105 110

Pro Asp Pro Lys Glu Asp Leu Arg Ile Ile Gln Leu Ala Met Pro Val  
115 120 125

Asn Asn Pro Gln Ile His Glu Phe Phe Leu Ser Ser Thr Glu Ala Gln  
130 135 140

Gln Ser Tyr Leu Gln Glu Phe Ser Lys His Ile Leu Glu Ala Ser Phe  
145 150 155 160

Asn Ser Lys Phe Glu Glu Ile Asn Arg Val Leu Phe Glu Glu Glu Gly  
165 170 175

Gln Gln Glu Gly Val Ile Val Asn Ile Asp Ser Glu Gln Ile Lys Glu  
 180 185 190  
 Leu Ser Lys His Ala Lys Ser Ser Ser Arg Lys Ser Leu Ser Lys Gln  
 195 200 205  
 Asp Asn Thr Ile Gly Asn Glu Phe Gly Asn Leu Thr Glu Arg Thr Asp  
 210 215 220  
 Asn Ser Leu Asn Val Leu Ile Ser Ser Ile Glu Met Glu Glu Gly Ala  
 225 230 235 240  
 Leu Phe Val Pro His Tyr Tyr Ser Lys Ala Ile Val Ile Leu Val Val  
 245 250 255  
 Asn Glu Gly Glu Ala His Val Glu Leu Val Gly Pro Lys Gly Asn Lys  
 260 265 270  
 Glu Thr Leu Glu Tyr Glu Ser Tyr Arg Ala Glu Leu Ser Lys Asp Asp  
 275 280 285  
 Val Phe Val Ile Pro Ala Ala Tyr Pro Val Ala Ile Lys Ala Thr Ser  
 290 295 300  
 Asn Val Asn Phe Thr Gly Phe Gly Ile Asn Ala Asn Asn Asn Asn Arg  
 305 310 315 320  
 Asn Leu Leu Ala Gly Lys Thr Asp Asn Val Ile Ser Ser Ile Gly Arg  
 325 330 335  
 Ala Leu Asp Gly Lys Asp Val Leu Gly Leu Thr Phe Ser Gly Ser Gly  
 340 345 350  
 Asp Glu Val Met Lys Leu Ile Asn Lys Gln Ser Gly Ser Tyr Phe Val  
 355 360 365  
 Asp Ala His  
 370

<210> 3  
 <211> 510  
 <212> PRT  
 <213> Arachis hypogaea

<400> 3  
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Ile Glu Thr Trp Asn Pro Asn Asn Gln Glu Phe Glu Cys Ala Gly Val	35	40	45
Ala Leu Ser Arg Leu Val Leu Arg Arg Asn Ala Leu Arg Arg Pro Phe	50	55	60
Tyr Ser Asn Ala Pro Gln Glu Ile Phe Ile Gln Gln Gly Arg Gly Tyr	65	70	75
Phe Gly Leu Ile Phe Pro Gly Cys Pro Arg His Tyr Glu Glu Pro His	85	90	95
Thr Gln Gly Arg Arg Ser Gln Ser Gln Arg Pro Pro Arg Arg Leu Gln	100	105	110
Gly Glu Asp Gln Ser Gln Gln Gln Arg Asp Ser His Gln Lys Val His	115	120	125
Arg Phe Asp Glu Gly Asp Leu Ile Ala Val Pro Thr Gly Val Ala Phe	130	135	140
Trp Leu Tyr Asn Asp His Asp Thr Asp Val Val Ala Val Ser Leu Thr	145	150	155
Asp Thr Asn Asn Asn Asp Asn Gln Leu Asp Gln Phe Pro Arg Arg Phe	165	170	175
Asn Leu Ala Gly Asn Thr Glu Gln Glu Phe Leu Arg Tyr Gln Gln Gln	180	185	190
Ser Arg Gln Ser Arg Arg Arg Ser Leu Pro Tyr Ser Pro Tyr Ser Pro	195	200	205
Gln Ser Gln Pro Arg Gln Glu Glu Arg Glu Phe Ser Pro Arg Gly Gln	210	215	220
His Ser Arg Arg Glu Arg Ala Gly Gln Glu Glu Glu Asn Glu Gly Gly	225	230	235
Asn Ile Phe Ser Gly Phe Thr Pro Glu Phe Leu Glu Gln Ala Phe Gln	245	250	255
Val Asp Asp Arg Gln Ile Val Gln Asn Leu Arg Gly Glu Thr Glu Ser			

260 265 270  
 Glu Glu Glu Gly Ala Ile Val Thr Val Arg Gly Gly Leu Arg Ile Leu  
 275 280 285  
 Ser Pro Asp Arg Lys Arg Arg Ala Asp Glu Glu Glu Glu Tyr Asp Glu  
 290 295 300  
 Asp Glu Tyr Glu Tyr Asp Glu Glu Asp Arg Arg Arg Gly Arg Gly Ser  
 305 310 315 320  
 Arg Gly Arg Gly Asn Gly Ile Glu Glu Thr Ile Cys Thr Ala Ser Ala  
 325 330 335  
 Lys Lys Asn Ile Gly Arg Asn Arg Ser Pro Asp Ile Tyr Asn Pro Gln  
 340 345 350  
 Ala Gly Ser Leu Lys Thr Ala Asn Asp Leu Asn Leu Leu Ile Leu Arg  
 355 360 365  
 Trp Leu Gly Leu Ser Ala Glu Tyr Gly Asn Leu Tyr Arg Asn Ala Leu  
 370 375 380  
 Phe Val Ala His Tyr Asn Thr Asn Ala His Ser Ile Ile Tyr Arg Leu  
 385 390 395 400  
 Arg Gly Arg Ala His Val Gln Val Val Asp Ser Asn Gly Asn Arg Val  
 405 410 415  
 Tyr Asp Glu Glu Leu Gln Glu Gly His Val Leu Val Val Pro Gln Asn  
 420 425 430  
 Phe Ala Val Ala Gly Lys Ser Gln Ser Glu Asn Phe Glu Tyr Val Ala  
 435 440 445  
 Phe Lys Thr Asp Ser Arg Pro Ser Ile Ala Asn Leu Ala Gly Glu Asn  
 450 455 460  
 Ser Val Ile Asp Asn Leu Pro Glu Glu Val Val Ala Asn Ser Tyr Gly  
 465 470 475 480  
 Leu Gln Arg Glu Gln Ala Arg Gln Leu Lys Asn Asn Asn Pro Phe Lys  
 485 490 495  
 Phe Phe Val Pro Pro Ser Gln Gln Ser Pro Arg Ala Val Ala  
 500 505 510

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<211> 473  
<212> PRT  
<213> Glycine max

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20 25 30  
Glu Glu Gly His Asp Phe Gln Glu Ser Lys Ala Lys Thr Thr Gln Thr  
35 40 45  
Ala Asn Lys Ala Met Glu Thr Gly Lys Glu Gly Gln Glu Ala Ala Glu  
50 55 60  
Ser Trp Thr Glu Trp Ala Lys Glu Lys Leu Ser Glu Gly Leu Gly Phe  
65 70 75 80  
Lys His Asp Gln Glu Ser Lys Glu Ser Thr Thr Asn Lys Val Ser Asp  
85 90 95  
Tyr Ala Thr Asp Thr Ala Gln Lys Ser Lys Asp Tyr Ala Thr Asp Thr  
100 105 110  
Ala Gln Lys Ser Lys Asp Tyr Ala Gly Asp Ala Ala Gln Lys Ser Lys  
115 120 125  
Asp Tyr Ala Gly Asp Ala Ala Gln Lys Thr Lys Asp Tyr Ala Ser Asp  
130 135 140  
Thr Ala Gln Thr Ser Lys Asp Tyr Ala Gly Asp Ala Ala Gln Lys Ser  
145 150 155 160  
Lys Gly Tyr Val Gly Asp Ala Ala Gln Lys Thr Lys Glu Tyr Val Gly  
165 170 175  
Asp Ala Ala Gln Lys Thr Lys Asp Tyr Ala Thr Asp Ala Ala Gln Lys  
180 185 190  
Thr Lys Asp Tyr Ala Thr Gln Lys Thr Lys Asp Tyr Ala Ser Asp Ala  
195 200 205  
Thr Asp Ala Ala Lys Lys Thr Lys Asp Tyr Ala Ala Gln Lys Thr Lys  
210 215 220



Asp Tyr Ala Ser Glu Ala Ser Asp Val Ala Gln Asn Thr Lys Asp Tyr  
 225 230 235 240  
 Ala Ala Gln Lys Thr Lys Asp Tyr Ala Ser Gly Gly Ala Gln Lys Thr  
 245 250 255  
 Lys Asp Tyr Ala Ser Gly Gly Ala Gln Lys Thr Lys Asp Tyr Ala Ser  
 260 265 270  
 Asp Ala Ala Gln Lys Thr Lys Asp Tyr Ala Ser Asp Gly Ala Gln Lys  
 275 280 285  
 Ser Lys Glu Tyr Ala Gly Asp Val Ala Leu Asn Ala Lys Asp Tyr Ala  
 290 295 300  
 Gln Lys Ser Lys Asp Tyr Ala Gly Asp Ala Ala Gln Asn Val Lys Asp  
 305 310 315 320  
 Tyr Ala Ser Asp Ala Val Gln Lys Arg Lys Glu Tyr Ser Gly Asp Ala  
 325 330 335  
 Ser His Lys Ser Lys Glu Ala Ser Asp Tyr Ala Ser Glu Thr Ala Lys  
 340 345 350  
 Lys Thr Lys Asp Tyr Val Gly Asp Ala Ala Gln Arg Ser Lys Gly Ala  
 355 360 365  
 Ala Glu Tyr Ala Ser Asp Ala Ala Gln Arg Thr Lys Glu Tyr Ala Gly  
 370 375 380  
 Asp Ala Thr Lys Arg Ser Lys Glu Ala Ser Asn Asp His Ala Asn Asp  
 385 390 395 400  
 Met Ala Gln Lys Thr Lys Asp Tyr Ala Ser Asp Thr Ala Gln Arg Thr  
 405 410 415  
 Lys Glu Lys Leu Gln Asp Ile Ala Ser Glu Ala Gly Gln Tyr Ser Ala  
 420 425 430  
 Glu Lys Ala Arg Glu Met Lys Asp Ala Ala Ala Glu Lys Ala Ser Asp  
 435 440 445  
 Ile Ala Lys Ala Ala Lys Gln Lys Ser Gln Glu Val Lys Glu Lys Leu  
 450 455 460  
 Gly Gly Gln His Arg Asp Ala Glu Leu  
 465 470

<210> 5  
<211> 18  
<212> PRT  
<213> Glycine max

<220>  
<223> At position 1, Xaa can be either Ser, Lys, His, or  
Gly

<220>  
<223> At position 2, Xaa can be either Ile or Gly

<220>  
<223> At position 4, Xaa can be either Glu, Asp, or Leu

<220>  
<223> At position 7, Xaa can be any amino acid.

<220>  
<223> At position 8, Xaa can be either Thr, Leu, Glu,  
Asn, Ala, Ser, or Pro

<220>  
<223> At position 9, Xaa can be either Met, Leu, or Asn

<220>  
<223> At position 10, Xaa can be either Lys or Arg

<220>  
<223> At position 11, Xaa can be either Leu or Arg

<220>  
<223> At position 12, Xaa can be any amino acid.

<220>  
<223> At position 13, Xaa can be either Gln, Asn, Ala,  
Leu, Ser, Arg, Pro, Ile, or His

<220>  
<223> At position 16, Xaa can be any amino acid.

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Xaa Xaa Asp Xaa Thr Ile Xaa Xaa Xaa Xaa Xaa Xaa Xaa Asn Ile Xaa  
1 5 10 15

Gln Thr

<210> 6  
 <211> 21  
 <212> PRT  
 <213> Glycine max  
  
 <220>  
 <223> At position 2, Xaa can be either Val or Ile  
  
 <220>  
 <223> At position 3, Xaa can be either Asp or Glu  
  
 <220>  
 <223> At position 5, Xaa can be either Asn or Thr  
  
 <220>  
 <223> At position 9, Xaa can be either Leu or Met  
  
 <220>  
 <223> At position 11, Xaa can be either Arg or Leu  
  
 <220>  
 <223> At position 12, Xaa can be either Arg, Asn, or Ala  
  
 <220>  
 <223> At position 13, Xaa can be either Ala or Gln  
  
 <220>  
 <223> At position 16, Xaa can be either Ala or Gly  
  
 <220>  
 <223> At position 18, Xaa can be either Asn or Thr  
  
 <220>  
 <223> At position 20, Xaa can be any amino acid  
  
 <220>  
 <223> At position 21, Xaa can be either Pro, Gly, Ala,  
 or Val  
  
 <400> 6  
 Gly Xaa Xaa Glu Xaa Ile Ala Thr Xaa Arg Xaa Xaa Xaa Asn Ile Xaa  
 1 5 10 15  
  
 Gln Xaa Xaa Xaa Xaa  
 20

<210> 7  
<211> 25  
<212> PRT  
<213> Glycine max

<220>  
<223> At position 2, Xaa can be either Ile, Val, Leu, or Phe

<220>  
<223> At position 3, Xaa can be either Asp or Glu

<220>  
<223> At position 4, Xaa can be either Glu or Leu

<220>  
<223> At position 5, Xaa can be either Asn or Thr

<220>  
<223> At position 8, Xaa can be either Gln or Thr

<220>  
<223> At position 9, Xaa can be either Met, Leu, Asn, or Pro

<220>  
<223> At position 10, Xaa can be either Arg or Pro

<220>  
<223> At position 11, Xaa can be either Leu, Arg, or Ala

<220>  
<223> At position 12, Xaa can be either Arg or Ala

<220>  
<223> At position 13, Xaa can be either Gln, Asp, Asn, or Arg

<220>  
<223> At position 15, Xaa can be either Ser or Ile

<220>  
<223> At position 18, Xaa can be either Asn, Gln, Pro, Leu, Thr, Ala, or Asp

<220>  
<223> At position 20, Xaa can be either Ser, Ala, or Gly

<220>

<223> At position 21, Xaa can be either any amino acid

<220>

<223> At position 22, Xaa can be Asp, Asn, or Pro

<220>

<223> At position 23, Xaa can be either Ile, Asp, Asn,  
Ala, Val, or Phe

<220>

<223> At position 25, Xaa can be either Asn, Ala, or Leu

<220>

<223> At position 16, Xaa can be either Ala or Gly

<400> 7

Gly Xaa Xaa Xaa Xaa Ile Ala Xaa Xaa Xaa Xaa Xaa Xaa Asn Xaa Xaa  
1 5 10 15

Gln Xaa Ser Xaa Xaa Xaa Xaa Tyr Xaa  
20 25

<210> 8

<211> 484

<212> PRT

<213> Glycine max

<400> 8

Met Ala Lys Leu Val Leu Ser Leu Cys Phe Leu Leu Phe Ser Gly Cys  
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Phe Ala Leu Arg Glu Gln Ala Gln Gln Asn Glu Cys Gln Ile Gln Lys  
20 25 30

Leu Asn Ala Leu Lys Pro Asp Asn Arg Ile Glu Ser Glu Gly Gly Phe  
35 40 45

Ile Glu Thr Trp Asn Pro Asn Asn Lys Pro Phe Gln Cys Ala Gly Val  
50 55 60

Ala Leu Ser Arg Cys Thr Leu Asn Arg Asn Ala Leu Arg Arg Pro Ser  
65 70 75 80

Tyr Thr Asn Gly Pro Gln Glu Ile Tyr Ile Gln Gln Gly Asn Gly Ile  
85 90 95

Phe Gly Met Ile Phe Pro Gly Cys Pro Ser Thr Tyr Gln Glu Pro Gln  
100 105 110  
Glu Ser Gln Gln Arg Gly Arg Ser Gln Arg Pro Gln Asp Arg His Gln  
115 120 125  
Lys Val His Arg Phe Arg Glu Gly Asp Leu Ile Ala Val Pro Thr Gly  
130 135 140  
Val Ala Trp Trp Met Tyr Asn Asn Glu Asp Thr Pro Val Val Ala Val  
145 150 155 160  
Ser Ile Ile Asp Thr Asn Ser Leu Glu Asn Gln Leu Asp Gln Met Pro  
165 170 175  
Arg Arg Phe Tyr Leu Ala Gly Asn Gln Glu Gln Glu Phe Leu Lys Tyr  
180 185 190  
Gln Gln Gln Gln Gln Gly Gly Ser Gln Ser Gln Lys Gly Lys Gln Gln  
195 200 205  
Glu Glu Glu Asn Glu Gly Ser Asn Ile Leu Ser Gly Phe Ala Pro Glu  
210 215 220  
Phe Leu Lys Glu Ala Phe Gly Val Asn Met Gln Ile Val Arg Asn Leu  
225 230 235 240  
Gln Gly Glu Asn Glu Glu Glu Asp Ser Gly Ala Ile Val Thr Val Lys  
245 250 255  
Gly Gly Leu Arg Val Thr Ala Pro Ala Met Arg Lys Pro Gln Gln Glu  
260 265 270  
Glu Asp Asp Asp Asp Glu Glu Glu Gln Pro Gln Cys Val Glu Thr Asp  
275 280 285  
Lys Gly Cys Gln Arg Gln Ser Lys Arg Ser Arg Asn Gly Ile Asp Glu  
290 295 300  
Thr Ile Cys Thr Met Arg Leu Arg Gln Asn Ile Gly Gln Asn Ser Ser  
305 310 315 320  
Pro Asp Ile Tyr Asn Pro Gln Ala Gly Ser Ile Thr Thr Ala Thr Ser  
325 330 335  
Leu Asp Phe Pro Ala Leu Trp Leu Leu Lys Leu Ser Ala Gln Tyr Gly  
340 345 350

Ser Leu Arg Lys Asn Ala Met Phe Val Pro His Tyr Thr Leu Asn Ala  
355 360 365

Asn Ser Ile Ile Tyr Ala Leu Asn Gly Arg Ala Leu Val Gln Val Val  
370 375 380

Asn Cys Asn Gly Glu Arg Val Phe Asp Gly Glu Leu Gln Glu Gly Gly  
385 390 395 400

Val Leu Ile Val Pro Gln Asn Phe Ala Val Ala Ala Lys Ser Gln Ser  
405 410 415

Asp Asn Phe Glu Tyr Val Ser Phe Lys Thr Asn Asp Arg Pro Ser Ile  
420 425 430

Gly Asn Leu Ala Gly Ala Asn Ser Leu Leu Asn Ala Leu Pro Glu Glu  
435 440 445

Val Ile Gln His Thr Phe Asn Leu Lys Ser Gln Gln Ala Arg Gln Val  
450 455 460

Lys Asn Asn Asn Pro Phe Ser Phe Leu Val Pro Pro Gln Glu Ser Gln  
465 470 475 480

Arg Ala Val Ala

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<211> 485  
<212> PRT  
<213> Glycine max

<400> 9  
Met Ala Lys Leu Val Leu Ser Leu Cys Phe Leu Leu Phe Ser Gly Cys  
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Phe Ala Leu Arg Glu Gln Ala Gln Gln Asn Glu Cys Gln Ile Gln Lys  
20 25 30

Leu Asn Ala Leu Lys Pro Asp Asn Arg Ile Glu Ser Glu Gly Gly Phe  
35 40 45

Ile Glu Thr Trp Asn Pro Asn Asn Lys Pro Phe Gln Cys Ala Gly Val  
50 55 60

Ala Leu Ser Arg Cys Thr Leu Asn Arg Asn Ala Leu Arg Arg Pro Ser

65 70 75 80  
 Tyr Thr Asn Gly Pro Gln Glu Ile Tyr Ile Gln Gln Gly Asn Gly Ile  
 85 90 95  
 Phe Gly Met Ile Phe Pro Gly Cys Pro Ser Thr Tyr Gln Glu Pro Gln  
 100 105 110  
 Glu Ser Gln Gln Arg Gly Arg Ser Gln Arg Pro Gln Asp Arg His Gln  
 115 120 125  
 Lys Val His Arg Phe Arg Glu Gly Asp Leu Ile Ala Val Pro Thr Gly  
 130 135 140  
 Val Ala Trp Trp Met Tyr Asn Asn Glu Asp Thr Pro Val Val Ala Val  
 145 150 155 160  
 Ser Ile Ile Asp Thr Asn Ser Leu Glu Asn Gln Leu Asp Gln Met Pro  
 165 170 175  
 Arg Arg Phe Tyr Leu Ala Gly Asn Gln Glu Gln Glu Phe Leu Lys Tyr  
 180 185 190  
 Gln Gln Gln Gln Gln Gly Gly Ser Gln Ser Gln Lys Gly Lys Gln Gln  
 195 200 205  
 Glu Glu Glu Asn Glu Gly Ser Asn Ile Leu Ser Gly Phe Ala Pro Glu  
 210 215 220  
 Phe Leu Lys Glu Ala Phe Gly Val Asn Met Gln Ile Val Arg Asn Leu  
 225 230 235 240  
 Gln Gly Glu Asn Glu Glu Glu Asp Ser Gly Ala Ile Val Thr Val Lys  
 245 250 255  
 Gly Gly Leu Arg Val Thr Ala Pro Ala Met Arg Lys Pro Gln Gln Glu  
 260 265 270  
 Glu Asp Asp Asp Asp Glu Glu Glu Gln Pro Gln Cys Val Glu Thr Asp  
 275 280 285  
 Lys Gly Cys Gln Arg Gln Ser Lys Arg Ser Arg Asn Gly Ile Asp Glu  
 290 295 300  
 Thr Ile Cys Thr Met Arg Leu Arg Gln Asn Ile Gly Gln Asn Ser Ser  
 305 310 315 320  
 Pro Asp Ile Tyr Asn Pro Gln Ala Gly Ser Ile Thr Thr Ala Thr Ser



325										330										335										
Leu	Asp	Phe	Pro	Ala	Leu	Trp	Leu	Leu	Lys	Leu	Ser	Ala	Gln	Tyr	Gly															
			340						345					350																
Ser	Leu	Arg	Lys	Asn	Ala	Met	Phe	Val	Pro	His	Tyr	Thr	Leu	Asn	Ala															
		355						360					365																	
Asn	Ser	Ile	Ile	Tyr	Ala	Leu	Asn	Gly	Arg	Ala	Leu	Val	Gln	Val	Val															
		370					375					380																		
Asn	Cys	Asn	Gly	Glu	Arg	Val	Phe	Asp	Gly	Glu	Leu	Gln	Glu	Gly	Gly															
385					390				395					400																
Val	Leu	Ile	Val	Pro	Gln	Asn	Phe	Ala	Val	Ala	Ala	Lys	Ser	Gln	Ser															
				405					410					415																
Asp	Asn	Phe	Glu	Tyr	Val	Ser	Phe	Lys	Thr	Asn	Asp	Arg	Pro	Ser	Ile															
			420					425					430																	
Gly	Asn	Leu	Ala	Gly	Ala	Asn	Ser	Leu	Leu	Asn	Ala	Leu	Pro	Glu	Glu															
		435					440					445																		
Val	Ile	Gln	His	Thr	Phe	Asn	Leu	Lys	Ser	Gln	Gln	Ala	Arg	Gln	Val															
		450					455					460																		
Lys	Asn	Asn	Asn	Pro	Phe	Ser	Phe	Leu	Val	Pro	Pro	Gln	Glu	Ser	Gln															
465					470					475				480																
Arg	Arg	Ala	Val	Ala																										
				485																										

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 <211> 185  
 <212> PRT  
 <213> Arachis hypogaea

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 Arg Asn Arg Ser Pro Asp Ile Tyr Asn Pro Gln Ala Gly Ser Leu Lys  
 20 25 30  
 Thr Ala Asn Asp Leu Asn Leu Leu Ile Leu Arg Trp Leu Gly Leu Ser  
 35 40 45

Ala Glu Tyr Gly Asn Leu Tyr Arg Asn Ala Leu Phe Val Ala His Tyr  
50 55 60

Asn Thr Asn Ala His Ser Ile Ile Tyr Arg Leu Arg Gly Arg Ala His  
65 70 75 80

Val Gln Val Val Asp Ser Asn Gly Asn Arg Val Tyr Asp Glu Glu Leu  
85 90 95

Gln Glu Phe Xaa Val Leu Val Val Pro Gln Asn Phe Ala Val Ala Gly  
100 105 110

Lys Ser Gln Ser Glu Asn Phe Glu Tyr Val Ala Phe Lys Thr Asp Ser  
115 120 125

Arg Pro Ser Ile Ala Asn Leu Ala Gly Glu Asn Ser Val Ile Asp Asn  
130 135 140

Leu Pro Glu Glu Val Val Ala Asn Ser Tyr Gly Leu Gln Arg Glu Gln  
145 150 155 160

Ala Arg Gln Leu Lys Asn Asn Asn Pro Phe Lys Phe Phe Val Pro Pro  
165 170 175

Ser Gln Gln Ser Pro Arg Ala Val Ala  
180 185

<210> 11  
<211> 46  
<212> PRT  
<213> Glycine max

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Glu Gln Glu Phe Leu Lys Tyr Gln Gln Gln Gln Gly Gly Ser Gln  
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Ser Gln Lys Gly Lys Gln Gln Glu Glu Glu Asn Glu Gly Ser  
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<210> 12  
<211> 156  
<212> PRT  
<213> Arachis hypogaea

<400> 12

Leu Thr Ile Leu Val Ala Leu Ala Leu Phe Leu Leu Ala Ala His Ala  
1 5 10 15

Ser Ala Arg Gln Gln Trp Glu Leu Gln Gly Asp Arg Arg Cys Gln Ser  
20 25 30

Gln Leu Glu Arg Ala Asn Leu Arg Pro Cys Glu Gln His Leu Met Gln  
35 40 45

Lys Ile Gln Arg Asp Glu Asp Ser Tyr Glu Arg Asp Pro Tyr Ser Pro  
50 55 60

Ser Gln Asp Pro Tyr Ser Pro Ser Pro Tyr Asp Arg Arg Gly Ala Gly  
65 70 75 80

Ser Ser Gln His Gln Glu Arg Cys Cys Asn Glu Leu Asn Glu Phe Glu  
85 90 95

Asn Asn Gln Arg Cys Met Cys Glu Ala Leu Gln Gln Ile Met Glu Asn  
100 105 110

Gln Ser Asp Arg Leu Gln Gly Arg Gln Gln Glu Gln Gln Phe Lys Arg  
115 120 125

Glu Leu Arg Asn Leu Pro Gln Gln Cys Gly Leu Arg Ala Pro Gln Arg  
130 135 140

Cys Asp Leu Asp Val Glu Ser Gly Gly Arg Asp Tyr  
145 150 155

<210> 13

<211> 166

<212> PRT

<213> Arachis hypogaea

<400> 13

Met Ala Ser Met Thr Gly Gly Gln Met Gly Arg Asp Pro Asn Ser Ala  
1 5 10 15

Arg Gln Gln Trp Glu Leu Gln Gly Asp Arg Arg Cys Gln Ser Gln Leu  
20 25 30

Glu Arg Ala Asn Leu Arg Pro Cys Glu Gln His Leu Met Gln Lys Ile  
35 40 45

Gln Arg Asp Glu Asp Ser Tyr Glu Arg Asp Pro Tyr Ser Pro Ser Gln  
50 55 60

Asp Pro Tyr Ser Pro Ser Pro Tyr Asp Arg Arg Gly Ala Gly Ser Ser  
65 70 75 80

Gln His Gln Glu Arg Cys Cys Asn Glu Leu Asn Glu Phe Glu Asn Asn  
85 90 95

Gln Arg Cys Met Cys Glu Ala Leu Gln Gln Ile Met Glu Asn Gln Ser  
100 105 110

Asp Arg Leu Gln Gly Arg Gln Gln Glu Gln Gln Phe Lys Arg Glu Leu  
115 120 125

Arg Asn Leu Pro Gln Gln Cys Gly Leu Arg Ala Pro Gln Arg Cys Asp  
130 135 140

Leu Asp Val Glu Ser Gly Gly Arg Asp Arg Tyr Ala Ala Ala Leu Glu  
145 150 155 160

His His His His His His  
165